

Clinical Effect of Ambroxol Hydrochloride Injection on 83 Patients with Acute Exacerbation of Chronic Bronchitis

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ABSTRACT Objective: To discuss the effect of ambroxol hydrochloride injection on acute exacerbation of chronic bronchitis. **Method:** 83 cases of patients with acute exacerbation of chronic bronchitis were randomly divided into observation group and control group, both were given conventional treatment, observation group added ambroxol hydrochloride injection, the control group added bromhexine hydrochloride injection, the effect, PaO_2 index and adverse reactions were compared. **Result:** The total effective rate (95.24%) and PaO_2 index (71.22 ± 8.92) mmHg in the observation group were higher than those in the control group, and the occurrence of adverse reactions (4.76%) was lower than that of the control group, $p < 0.05$. **Conclusion:** Ambroxol hydrochloride injection can effectively relieve acute exacerbation of chronic bronchitis, improve PaO_2 index, and have fewer adverse reactions, be worthy of promotion.

KEYWORD

Chronic bronchitis
Acute exacerbation
Ambroxol hydrochloride injection

1. Introduction

Chronic bronchitis is more common in the elderly; it refers to the chronic, non-specific inflammation of trachea, surrounding tissue and bronchial mucosal inflammation. Early symptoms of the disease are mild, the gradual development of disease can lead to increased inflammation, the symptoms can last for many years and develop into pulmonary heart disease, emphysema and other diseases. The pathology is characterized by hyperplasia of bronchial glands and increase of mucus secretion,

clinical manifestations is long-term expectoration, chronic cough, wheezing, etc. It is recurrent. Patients has significantly enlarged lungs breathe sounds, accompanied by wet and dry rales, increased white blood cells and X-ray texture. Chronic bronchitis is a common disease of respiratory system. Patients have coughing, sputum and other symptoms caused by mucosal inflammation or excessive mucus secretion at bronchus. The sputum usually appears white foam, because the attack is frequent, there will be the symptoms of declined pulmonary function and gradually declined respiratory function. Under the premise of changed pathology, exposing to poison gas, or season change, catching cold, overwork, smoking and other factors may lead to a more acute disease tendency. In the acute phase, corresponding signs or symptoms will develop further on the basis of original pathology, at this time, a large number of neutral granular cells infiltrations lead to coughs more serious, severe congestion or edema at the bronchus wall. While the glandular secretion is more active, showing purulent sputum or purulent characteristics. The condition becomes worse, this clinical

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symptoms is urgently needed to alleviate and control. Therefore, on the basis of conventional asthma spasm and antibiotics therapy, cough suppressant & expectorant has a far-reaching significance for ensuring airway clear [1].

Ambroxol hydrochloride injection has the characteristics of secretions decomposition and mucus exclusion, can effectively remove secretions and reduce mucous retention as much as possible, and improve patient respiratory conditions. Ambroxol hydrochloride injection can make patients return to normal mucus secretion, significantly reduce cough and sputum volume. Under the condition of not being hindered, the active substance in the respiratory mucosa can effectively play a normal protection function. At the same time, ambroxol hydrochloride injection has a similar effect of strengthening antibiotic concentration in lung tissue and the corresponding secretions, which significantly shorten the time of treatment with antibiotics. Therefore, the application of ambroxol hydrochloride injection has big benefits in treatment of respiratory diseases. To explore the therapeutic effect of ambroxol hydrochloride injection on acute exacerbation of chronic bronchitis, two different methods were used to treat patients in our hospital, and the effect, PaO₂ index and adverse reactions were compared. Now the report is as follows [2].

2. Material and Method

2.1. General Information

83 patients with hypertensive cerebral hemorrhage, who were treated in our hospital from July 2013 to July 2014, were selected as research subjects, and randomly divided into observation group and control group. Observation group contained 20 female patients and 22 male patients, the age range was 40 to 85 years old, mean age was 70.26 ± 5.49 years old, the course of chronic bronchitis was from 4 to 18 years, the average course of disease was (10.11 ± 1.58) years; The course of acute attack of chronic bronchitis was 5 to 15 days, the average duration of disease was (6.33 ± 2.12) days; there were 10 cases with respiratory failure, 15 cases with coronary heart disease, and 17 cases with hypertension. The control group contained 21 female patients and 20 male patients, the age range was 41 to 86 years old, mean age was 71.32 ± 5.11 years old; the course of chronic bronchitis was from 5 to 19 years, the average course of disease was (11.12 ± 1.63) years; The course of acute attack of chronic bronchitis was 4 to 15 days, the average duration of disease was (6.41 ± 1.85) days, there were 12 cases with respiratory failure, 13 cases with coronary heart disease, and 16 cases with hypertension. Statistical analysis showed that there was no significant difference between two groups in gender, age, duration of disease and other general information ($p > 0.05$), therefore, the two groups were comparable.

2.2. Treatment Method

The observation group was treated with conventional

therapy, such as expectorant, oxygen inhalation, ant-infection etc, on this basis, 30 mg of ambroxol hydrochloride injection dissolved in 250 mL of 5% glucose injection was given, 2times a day, continuous intravenous infusion for 14 days. The control group was treated with bromhexine hydrochloride injection on the basis of routine therapy, 1 time a day, and 10 mg each time. The treatment effect, PaO₂ index and adverse events of the two groups were observed and compared after 14 days [3].

2.3. Efficacy Judgment

Therapeutic efficacy should be made according to the clinical guiding principle of medicine for eliminating phlegm and stopping cough developed by the Ministry of health food and Drug Administration.

(1) Marked effect: Cough and corresponding symptoms in chest X-ray, pulmonary rales, wheezing and other symptoms completely disappear or almost disappear, the sputum is completely or almost excluded, PaO₂ is within the normal range (75 to 100 mmHg).

(2) Effective: Cough, wheezing and other symptoms has been relieved, a little sputum is not discharged, PaO₂ index was close to normal;

(3) Ineffective: The above indicators have no change or even worse than before.

The total efficiency = (cases of marked effect + cases of effective)/ the total of cases × 100%.

2.4. Statistical methods

The acquired data was analyzed by SPSS 18.0 statistical software statistically. Measurement data were expressed as mean ± standard deviation and analyzed by *t* test; count data were analyzed by X² test, $p < 0.05$ was considered as statistical significance.

3. Results

3.1. Comparison of treatment effect

After 14 days of treatment, the total effective rate of the observation group was 95.24%, the control group was 75.61%. The total effective rate of the observation group was higher than that of the control group, and the difference was statistically significant ($p < 0.05$). See Table 1.

Table 1. Comparison of effect between two groups [n(%)].

Group	Case	Marked effect	Effective	Ineffective	Total efficiency
Observation group	42	28 (66.67)	12 (28.57)	2 (4.76)	40 (95.24)
Control group	41	20 (48.78)	11 (26.83)	10 (24.39)	31 (75.61)

Note: the difference of total effective rate between two groups was statistically significant, $p < 0.05$.

3.2. Comparison of PaO₂ index

After 14 days of treatment, the PaO₂ index of the observation

group was (76.23 ± 9.33) mmHg, and the control group was (71.22 ± 8.92) mmHg. The PaO₂ index of the observation group was higher than that of the control group, and the difference was significant, $p < 0.05$.

3.3. Comparison of adverse events

After 14 days of treatment, there were 10 cases of patients with adverse reactions, the observation group accounted for 2 cases (1 case of indigestion, 1 case of vomiting), and the adverse reaction rate was 4.76%. The control group accounted for 8 cases (3 cases of indigestion, 2 cases of vomiting, and 3 cases of serum aminotransferase elevating), the adverse reaction rate was 19.51%. The occurrence of adverse reactions in the observation group was significantly lower than that in the control group, and the difference was significant, $p < 0.05$.

4. Discussion

Chronic bronchitis cause non-specific chronic inflammation of the bronchus, trachea and surrounding tissues because of infection or non-infectious factors, the frequent episodes of inflammation cause atrophy and even rupture of submucosal smooth muscle bundles, the progression of disease may lead to the fibrous tissue hypertrophy of the trachea, lumen collapse, stiffness and other symptoms appear, finally the airway is blocked. The main symptoms were frequent cough, expectoration accompanied by wheezing. At the time of acute attack, it will be accompanied by severe cough, a lot of sputum, severe wheezing and yellow sputum, viscosity of sputum is big and different to cough out. The narrowed, deformed respiratory tract may be blocked by sputum. Bacteria thrive in the airway, leading to persistent infections, respiratory failure, heart failure and other complications, which bring a life-threatening to the patients. In addition to control of infection, the key lies in the reasonable and scientific expectorant. Especially for those who are elderly and infirm, expectorant shall be listed as the key of treatment. Therefore, seeking the best expectorant drugs has a far-reaching significance for treatment of such disease. Acute attack of chronic bronchitis can produce a large amount of mucus secretion in a short time, while these secretions can promote the secondary infection, it is often accompanied by fever and other inflammatory manifestations, and ultimately induces respiratory failure, heart failure and other serious complications [4]. At the same time, the symptoms of systematic fever may also cause respiratory system and circulatory system failure, which can threaten the patient's life. The clinical treatment of the disease mainly was anti-infection, and takes into account expectorant in the meanwhile, improving ventilation. Ambroxol hydrochloride injection has the function of

eliminating phlegm and dissolving exudates, can effectively eliminate the respiratory tract mucus secretion and reduces phlegm retention. Ambroxol hydrochloride injection is a kind of effective mucus dissolving medicament; it is an ideal drug in treatment of cough, expectorant and the patients' improvement. The drug reacts with tracheal secretion cells, resulting in more secretion, enhancing ciliary swing. The scavenging ability of mucus transport system is also enhanced. The acid mucopolysaccharide fiber in sputum is decomposed, so the sputum is well diluted and easy to discharge, eventually improving the respiratory conditions. Ambroxol hydrochloride injection was well tolerated, the toxicity index is low, so it can be used for a long time, which is suitable for weak expectoration and unnormal mucus secretion patients with acute exacerbation of chronic bronchitis [5]. Besides, Mucosolvan is a kind of absorbing protective agent, has the function of inflammation inhibition, antioxidant and airway smooth muscle relaxation, and it is safe in clinical application.

In our hospital, the observation group received treatment of ambroxol hydrochloride injection, the results of this study showed that the total effective rate (95.24%) and PaO₂ index (76.23 ± 9.33) mmHg in the observation group were higher than those in the control group, $p < 0.05$. In addition, the occurrence of adverse reactions in the observation group (4.76%) was lower than that in the control group, $p < 0.05$. Thus, ambroxol hydrochloride injection can effectively alleviate the condition of patients with acute exacerbations of chronic bronchitis, has the advantages of fast effect and high security, be worthy of popularization and application.

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